8-21-3 #28 DAC

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Elazar Rabbani et al.

Serial No. 08/978,632 — Group Art Unit: 1635

Filed: November 25, 1997 — Examiner: Mary M. Schmidt

Title: NOVEL PROPERTY EFFECTING AND/OR PROPERTY EXHIBITING COMPOSITIONS FOR THERAPEUTIC AND DIAGNOSTIC USES

527 Madison Avenue, 9th Floor
New York, New York 10022
August 20, 2003

FILED BY EXPRESS MAIL

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION UNDER 37 C.F.R. §1.137(b) TO REVIVE AN UNINTENTIONALLY ABANDONED APPLICATION

Dear Sirs:

Applicants submit this Petition to the Commissioner under the provisions of 37 C.F.R. §1.137(b) to revive the above-identified application in which taking action was unintentionally delayed. A response was originally due on August 20, 2002 to the Office Action which issued May 20, 2002. A copy of the Office Action is attached to this Petition as Exhibit 1. Upon the expected granting of this Petition, the accompanying response in the form of an Amendment Under 37 C.F.R. §1.115 will be considered as having been timely filed.

The above-identified application became unintentionally abandoned after August 20, 2002, which was the shortened statutory reply date that a response to the Office Action was due.

08/22/2003 AWONDAF1 00000032 ~~051135~~ ~~08978632~~
01 FC:2453 ~~650.00 DA~~

Enz-53 (C)

EXPRESS MAIL CERTIFICATE
"Express Mail" Label No. EL492433394US Deposit Date August 20, 2003 I hereby certify that this paper and the attachments herein are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington DC 20231. Natalie Bogdanos — August 20, 2003 Natalie Bogdanos (Date) Reg. No. 51,480

It is hereby requested that this application be revived because the entire delay in filing the response to the May 20, 2002 Office Action until the filing of this Petition was unintentional. A Terminal Disclaimer to Accompany Petition is attached to this document as Exhibit 2.

As indicated above, a response to the May 20, 2002 Office Action in the form of an Amendment Under 37 C.F.R. § 1.115 is being submitted concurrently herewith and is attached as Exhibit 3.

The fee for filing a Petition to Revive an Unintentionally Abandoned Application Under 37 C.F.R. §1.137(b) is $650.00 for a small entity. Small entity status was previously established in this application and is still applicable. The Patent and Trademark Office is hereby authorized to charge Deposit Account No. 05-1135 for the requisite small entity fee of $650.00. The Patent and Trademark Office is further authorized hereby to charge Deposit Account No. 05-1135 for any other fees required in connection with this Petition, the attached Amendment (Exhibit 3), or Terminal Disclaimer (Exhibit 2).

A duplicate copy of this Petition without attached Exhibits 1-3 is also submitted herewith.

Favorable action on this Petition is earnestly solicited.

Respectfully submitted,

Natalie Bogdanos

Natalie Bogdanos
Registration No. 51,480
Attorney for Applicants

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/978,632	11/25/1997	ELAZAR RABBANI	ENZ-53(C)	4638

28169 7590 05/20/2002

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NEW YORK, NY 10022

EXAMINER	
SCHMIDT, MARY M	
ART UNIT	PAPER NUMBER
1635	26

DATE MAILED: 05/20/2002

CANCELLED

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	08/978,632	RABBANI ET AL.
	Examiner	**Art Unit**
	Mary Schmidt	1635

The MAILING DATE of this communication appears on the cover sheet with the correspondence address

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *246-270* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *246-270* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112/Response to Arguments

2. Claims 246-270 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for the same reasons of record as set forth in the Official action mailed 02/03/99, 11/08/99 and 12/19/00 for old claims 1-24 and 245, and as set forth in the Official action mailed 08/28/01 for claims 246-270.

Applicant's arguments filed 2/28/02 have been fully considered but they are not persuasive. Applicants' reply is found on pages 5-10 of the response.

Applicant cites on pages 5, 6, and 7, certain passages from the guidelines to explain the standards for teaching "possession" of an invention as well as standards for "a representative number of species" of a claimed genus.

Applicants' assert that an adequate description has been provided and point to pages 33-47 and 53 of the specification to teach descriptions of the claimed constructs. Applicants' further

point to figures 1-7 to show use of drawings to show description of the claimed invention. Applicants' further note that actual reduction to practice is not required to satisfy the written description requirement.

In response, **MPEP 2163** teaches the following conditions for the analysis of the claimed invention at the time the invention was made in view of the teachings of the specification and level of skill in the art at the time the invention was made:

> **The claimed invention as a whole may not be adequately described where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence....A lack of written description issue also arises if the knowledge and level of skill in the art would not permit one skilled in the art to immediately envisage the product claimed from the disclosed process....Generally, there is an inverse correlation between the level of skill and knowledge in the art and the specificity of disclosure necessary to satisfy the written description requirement....The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice..., reduction to drawings..., or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus.**

The specification as filed teaches in the figures numerous potential constructs using certain modified features for production of products in a cell. Primarily, the specification teaches vector-type constructs having features which are meant to enhance the vector-like constructs for

targeting the expressed product in a cell. Such vector-type constructs require specific sequences of nucleic acids, modified nucleotides or analogs for the expression of the claimed products: antisense RNA, antisense DNA, sense RNA, ribozymes, decoys, messenger RNA or protein.

Neither the specification nor the drawings provided a clear picture of the completed vector-type constructs contemplated, such that one of skill in the art would have been able to immediately envisage the finished product since a representative number of species of such constructs is not adequately described by the most basic necessary chemical and physical structure of nucleic acid constructs, the nucleic acid sequence structure. Most of the drawings in the instant specification taught "ball-and stick" vector-type constructs having a partial idea of the pertinent features of the vectors, but not having a substantially complete sequence. Applicant argues that a reduction to practice is not necessary at the time of the invention, but in the instant case, knowledge of the sequence would be necessary for synthesizing the actual constructs. When considering that instant claim 246 claims any vector construct made of nucleic acids that when present in a cell produces a product, the breath of the claimed invention is extremely broad. From viewing the drawings, for instance figures 1-7 as pointed out by Applicant, one of skill in the art would envision a primer with any ligand(s) attaching to what appears to stand for a nucleic acid vector and primers having fusogenic peptides and tails. The specification teaches prophetically on pages 33-47 the design of any vector construct having such ligands and additional modifications. There is no evidence on the record of a relationship between the structure of the lines and features in drawings 1-7 for instance to specific nucleic acid sequences

of vectors or the use of known vectors from which specific modifications may be added. Sequence structure of nucleic acids is a necessary starting point for making a vector for expression of nucleic acid products as claimed. One of skill in the art would not have recognized that Applicant was in possession of a representative number of species of any finished expression vectors in view of the teachings of figures 1-7 and pages 33-47 of the specification since no specific guidance was given for the design of the most basic elements of the claimed nucleic acid constructs. The scope of the claim includes numerous structural variants, and the genus is highly variant because a significant number of structural differences between genus members is permitted. Although the specification states that these types of changes are routinely done in the art, the specification and claim do not provide any guidance as to what changes should be made and in what order. The general knowledge and level of skill in the art do not supplement the omitted description of sequence structure, as a starting point for instance, because specific, not general, guidance is what is needed for making the finished constructs. For these reasons, Applicant was not in possession of the claimed genus at the time the invention was made.

Claim Rejections - 35 USC § 102/Response to Arguments

3. New claims 246-270 stand rejected under 35 U.S.C. 102(e) as being anticipated by Meyer et al. for the same reasons of record as set forth in the Official action mailed 02/03/99, 11/08/99

and 12/19/00 for old claims 1-24, and as set forth in the Official action mailed 08/28/01 for claims 246-270.

Applicant's arguments filed 2/28/02 have been fully considered but they are not persuasive.

Applicants' assert that Meyer et al. does not teach constructs defined by the instant specification and state that the ODN-peptide conjugates of Meyer et al. clearly are not constructs because "the conjugates cannot integrate into cellular nucleic acid or exist in an extrachromosomal state. The ODN-peptide conjugates certainly cannot propagate copies of itself in either the integrated or the extrachromosomal state. In other words, the ODN-peptide conjugates of Meyer et al. are not capable of self replication."

In response, Applicant is arguing limitations of the claimed constructs which are not present in the claims. The claims do not require that the constructs integrate into cellular nucleic acid or exist in an extrachromosomal state, nor that they can propagate copies and are capable of self replication. Claim 247 recites wherein the construct is linear. The claims don't recite that such linear constructs self-replicate.

Meyer et al. thus continues to anticipate the claimed invention.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Mary M. Schmidt*, whose telephone number is (703) 308-4471.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, *John LeGuyader,* may be reached at (703) 308-0447.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Analyst, *Kay Pinkney*, whose telephone number is (703) 305-3553.

M. M. Schmidt
May 16, 2002

JOHN L. LeGUYADER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

UNITED STATES PATENT & TRADEMARK OFFICE
Washington, D.C. 20231

REQUEST FOR PATENT FEE REFUND

1 Date of Request: 6/2/04

2 Serial/Patent # 08/978,632

3 Please refund the following fee(s):	4 PAPER NUMBER	5 DATE FILED	6 AMOUNT
Filing			$
Amendment			$
Extension of Time			$
Notice of Appeal/Appeal			$
Petition			$
Issue			$
✓ Cert of Correction ~~Terminal Disc.~~	30	8/28/03	$ 55.
Maintenance			$
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7 TOTAL AMOUNT OF REFUND $ 55.

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- ✓ Credit Deposit A/C #:

9 05--11/35

10 REASON:

- Overpayment
- Duplicate Payment
- ✓ No Fee Due (Explanation):

11 REFUND REQUESTED BY:

TYPED/PRINTED NAME: Andrea Smith TITLE: Pets. Exmr.

SIGNATURE: [signature] PHONE: 703/308-6711

OFFICE: Dir. of Petitions

****

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APPROVED: [signature] DATE: 6/3/04

Instructions for completion of this form appear on the back. After completion, attach white and yellow copies to the official file and mail or hand-carry to:

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Refund Branch
Crystal Park One, Room 802B

FORM PTO 1577
(01/90)

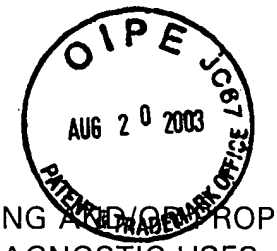
#30

TERMINAL DISCLAIMER TO ACCOMPANY PETITION (Period of disclaimer to be completed by Petitions Examiner)	Docket Number (Optional) ENZ-53(C)

In re Application of:
Name: Rabbani et al.

Application Number: 08/978,632

Filed: November 25, 1997



For: NOVEL PROPERTY EFFECTING AND/OR PROPERTY EXHIBITING COMPOSITIONS FOR THERAPEUTIC AND DIAGNOSTIC USES

The owner*, Enzo Diagnostics, Inc of 100 percent interest in the above-identified application hereby disclaims a terminal part of the term of any patent granted the above-identified application equivalent to: (1) if the above-identified application is a design application, the period of abandonment of the above-identified application, and (2) if the above-identified application is a utility or plant application, the lesser of: (a) the period of abandonment of the application; or (b) the period extending beyond twenty years from the date on which the above-identified application was filed in the United States or, if the application contains a specific reference to an earlier filed application(s) under 35 U.S.C. 120, 121, or 365(c), from the date on which the earliest such application was filed. This disclaimer also applies to any patent granted on a utility or plant application filed before June 8, 1995, or a design application, that contains a specific reference under 35 U.S.C. 120, 121, or 365(c) to the above-identified application. This disclaimer is binding upon the grantee, and its successors or assigns.

Check either box 1 or 2 below, if appropriate.

1. /__/For submissions on behalf of an organization (e.g. corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

2. /X/ The undersigned is an attorney of record.

Natalie Bogdanos — August 20, 2003
Signature — Date
Reg. No. 51,480
Natalie Bogdanos
Typed or printed name

08/22/2003 AWONDAF1 00000040 051135 08978632
02 FC:2814 55.00 DA

/X/ The Patent and Trademark Office is hereby authorized to charge Deposit Account No. 05-1135 for the Terminal Disclaimer fee Under 37 C.F.R. 1.20(d) and for any other fees required.

/_/ Terminal disclaimer fee under 37 CFR 1.20(d) included.

* Certification under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner). Form PTO/SB/96 may be used for making this certification. See MPEP ∋ 324.

THE STATEMENT BELOW IS FOR OFFICE USE ONLY

In accordance with the decision granting the petition filed on _____, this terminal disclaimer is accepted. The period of abandonment specified above has been accepted as equivalent to ____ months.

~~08/22/2003 AWONDAF1 00000032 051135 08978634~~
~~02 FC:2814 55.00 DA~~

Petitions Examiner

Adjustment date: 06/03/2004 AKELLEY
08/22/2003 AWONDAF1 00000040 051135 08978632
02 FC:2814 55.00 DA

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#99

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Rabbani et al.	
Serial No.:	08/978,633	Group Art Unit: 1635
Filed:	November 25, 1997	Examiner: Mary M. Schmidt
For:	**NOVEL PROPERTY EFFECTING AND/OR PROPERTY EXHIBITING COMPOSITIONS FOR THERAPEUTIC AND DIAGNOSTIC USES**	

527 Madison Avenue (9th Floor)
New York, New York 10022
August 20, 2003

FILED BY EXPRESS MAIL

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. §1.115
(IN RESPONSE TO THE MAY 20, 2002 OFFICE ACTION)

Dear Sirs:

This is a response (Amendment Under 37 C.F.R. §1.115) to the Office Action issued on May 20, 2002 in connection with the above-identified application. A response to the May 20, 2002 Office Action was originally due August 20, 2002. This response is accompanied by Petition Under 37 C.F.R. §1.137(b) to Revive an Unintentionally Abandoned Application. Upon granting of the Petition, this response will be considered as having been timely filed.

Enz-53(C)

EXPRESS MAIL CERTIFICATE
"Express Mail" Label No. EL492433394US Deposit Date August 20, 2003 I hereby certify that this paper and the attachments herein are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington DC 20231. Natalie Bogdanos August 20, 2003 Natalie Bogdanos Date Reg. No. 51,480

CLAIM AMENDMENTS

Claims 1-24 (canceled)

Claim 25. (original) The construct of claim 24, wherein an antibody is bound to said hybridized polynucleotide tail sequences.

Claim 26. (original) The construct of claim 25, wherein said antibody comprises a polyclonal or monoclonal antibody.

Claim 27. (original) A composition comprising:

(a) a non-natural entity which comprises:

at least one domain to a nucleic acid component; and at least one domain to a cell of interest; and

(b) said nucleic acid component;

wherein the domain or domains to said nucleic acid component are different from the domain or domains to said cell.

Claim 28. (original) The composition of claim 27, wherein said entity comprises a binder.

Claim 29. (original) The composition of claim 28, wherein said binder and said domain are the same.

Claim 30. (original) The composition of claim 28, wherein said binder and said domain are different.

Claim 31. (original) The composition of claim 28, wherein said binder is selected from a polymer, a matrix, a support, or a combination of any of the foregoing.

Claim 32. (original) The composition of claim 27, wherein said nucleic acid component is selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a viroid, a phage, a plasmid, a plasmid vector, a bacterium and a bacterial fragment, or a combination of the foregoing.

Claim 33.(original) The composition of claim 27, wherein said cell is prokaryotic or eukaryotic.

Claim 34.(original) The composition of claim 27, wherein said domains are attached covalently or noncovalently, or through a binder, or a combination thereof.

Claim 35.(original) The composition of claim 34, wherein said noncovalent binding is selected from ionic interactions and hydrophobic interactions, or a combination thereof.

Claim 36. (original) The composition of claim 35, wherein said noncovalent binding comprises a specific complex.

Claim 37. (original) The composition of claim 36, wherein said specific complex is mediated by a ligand binding receptor.

Claim 38. (original) The composition of claim 37, wherein said ligand binding receptor is selected from a polynucleotide sequence to be recognized by its complementary sequence, an antigen to be recognized by its corresponding monoclonal or polyclonal antibody, an antibody to be recognized by its corresponding antigen, a lectin to be recognized by its corresponding sugar, a hormone to be recognized by its receptor, a receptor to be recognized by its hormone, an inhibitor to be recognized by its enzyme, an enzyme to be recognized by its inhibitor, a cofactor to be recognized by its cofactor enzyme binding site, a cofactor enzyme binding site to be recognized by its cofactor, a binding ligand to be recognized by its substrate, or a combination of the foregoing.

Claim 39. (original) The composition of claim 28, wherein the domain to said nucleic acid component and the domain to said cell of interest are natural, and said binder is attached to said nucleic acid component by means other than a natural binding site.

Claim 40. (original) The composition of claim 39, wherein said binder comprises modified fibronectin or modified polylysine, or both.

Claim 41. (original) The composition of claim 27, wherein said cell of interest is contained within an organism.

Claim 42. (original) The composition of claim 27, further comprising said cell of interest.

Claim 43. (original) A method of introducing a nucleic acid component into a cell comprising:

(a) providing the composition of claim 27; and

(b) administering said composition.

Claim 44. (original) The method of claim 43, wherein administering is carried out in vivo.

Claim 45. (original) The method of claim 43, wherein administering is carried out ex vivo.

Claim 46. (original) A kit for introducing a nucleic acid component into a cell of interest, comprising in packaged containers or combination:

(a) a non-natural entity which comprises at least one domain to said nucleic acid component, and a domain to said cell of interest;

(b) a nucleic acid component, optionally with

(c) buffers and instructions.

Claim 47. (original) A composition comprising:

an entity which comprises at least one domain to a cell of interest, wherein said domain or domains are attached to a nucleic acid component which is in non-double stranded form.

Claim 48. (original) The composition of claim 47, wherein said entity comprises a binder.

Claim 49. (original) The composition of claim 48, wherein said binder and said domain are the same.

Claim 50. (original) The composition of claim 48, wherein said binder and said domain are different.

Claim 51.(original) The composition of claim 48, wherein said binder is selected from a polymer, a matrix, a support, or a combination of any of the foregoing.

Claim 52. (original) The composition of claim 47, wherein said cell is prokaryotic or eukaryotic.

Claim 53. (original) The composition of claim 47, wherein said nucleic acid component is selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a viroid, a phage, a plasmid, a plasmid vector, a bacterium and a bacterial fragment, or a combination of the foregoing.

54. (original) The composition of claim 47, wherein said domain is selected from covalent bonding and noncovalent binding, or a combination thereof.

Claim 55. (original) The composition of claim, 54, wherein said noncovalent binding is selected from ionic interactions and hydrophobic interactions, or a combination thereof.

Claim 56. (original) The composition of claim 54, wherein said noncovalent binding comprises a specific complex.

Claim 57. (original) The composition of claim 56, wherein said specific complex is mediated by a ligand binding receptor.

Claim 58. (original) The composition of claim 57, wherein said ligand binding receptor is lselected from a polynucleotide sequence to be recognized by its complementary sequence, an antigen to be recognized by its correspondi ng monoclonal or polyclonal antibody, an antibody to be recognized by its corresponding antigen, a lectin to be recognized by its corresponding sugar, a hormone to be recognized by its receptor, a receptor to be recognized by its hormone, an inhibitor to be recognized by its enzyme, an enzyme to be recognized by its inhibitor, a cofactor to be recognized by its cofactor enzyme binding site, a cofactor enzyme binding site to be recognized by its cofactor, a binding ligand to be recognized by its substrate, or a combination of the foregoing.

Claim 59. (original) The composition of claim 47, wherein said cell of interest is contained within an organism.

Claim 60. (original) The composition of claim 47, further comprising said cell of interest.

Claim 61. (original) A method of introducing a nucleic acid component into a cell comprising:

(a) providing the composition of claim 47; and

(b) administering said composition.

Claim 62.(original) The method of claim 61, wherein administering is carried out in vivo.

Claim 63.(original) The method of claim 61, wherein administering is carried out ex vivo.

Claim 64. (original) A kit for introducing a nucleic acid component into a cell of interest, comprising in packaged co ntainers or combinations:

(a) an entity which comprises a domain to said cell of interest, wherein said domain is attached to a nucleic acid component which is in non-double stranded form, optionally with

(b) buffers and instructions.

Claim 65. (original) A composition comprising:

an entity which comprises a domain to a nucleic acid component,

wherein said domain is attached to a cell of interest.

Claim 66.(original) The composition of claim 65, wherein said entity comprises a binder.

Claim 67. (original) The composition of claim 66, wherein. said binder and said domain are the same.

Claim 68.(original) The composition of claim 66, wherein said binder and said domain are different.

Claim 69. (original) The composition of claim 66, wherein said binder is selected from a polymer, a matrix, a support, or a combination of any of the foregoing.

Claim 70. (original) The composition of claim 66, wherein said nucleic acid component is selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a viroid, a phage, a plasmid, a plasmid vector, a bacterium and a bacterial fragment, or a combination of the foregoing.

Claim 71. (original) The composition of claim 65, wherein said cell is eukaryotic or prokaryotic.

Claim 72. (original) The composition of claim 65, wherein said domain is selected from covalent bonding and noncovalent binding, or a combination thereof.

Claim 73. (original) The composition of claim 72, wherein said noncovalent binding is selected from ionic interactions and hydrophobic interactions, or a combination there of.

Claim 74. (original) The composition of claim 72, wherein said noncovalent binding comprises a specific complex.

Claim 75.(original) The composition of claim 74, wherein said specific complex is mediated by a ligand binding receptor.

Claim 76. (original) The composition of claim 75, wherein said ligand binding receptor is selected from a polynucleotide sequence to be recognized by its complementary sequence, an antigen to be recognized by its corresponding monoclonal or polyclonal antibody, an antibody to be recognized by its corresponding antigen, a lectin to be recognized by its corresponding sugar, a hormone to be recognized by its receptor, a receptor to be recognized by its hormone, an inhibitor to be recognized by its enzyme, an enzyme to be recognized by its inhibitor, a cofactor to be recognized by its cofactor enzyme binding site, a cofactor enzyme binding site to be recognized by its cofactor, a binding ligand to be recognized by its substrate, or a combination of the foregoing.

Claim 77. (original) The composition of. claim 65, further comprising said cell of interest.

Claim 78. (original) The composition of claim 65, wherein said cell of interest is contained within an organism.

Claim 79. (original) A method of introducing a nucleic acid component into a cell comprising:

(a) providing the composition of claim 65; and

(b) administering said composition.

Claim 80. (original) The method of claim 79, wherein administering is carried out in vivo.

Claim 81. (original) The method of claim 79, wherein administering is carried out ex vivo.

Claim 82. (original) A kit for introducing a nucleic acid component into a cell of interest, comprising in packaged containers or combination:

(a) an entity which comprises a domain to said nucleic acid component, wherein said domain is attached to said cell of interest, optionally with

(b) buffers and instructions.

Claim 83. (original) A multimeric complex composition comprising more than one monomeric unit attached.

(a) to each other through polymeric interactions, or

(b) to a binding matrix through polymeric interactions, or

(c) both (a) and (b)

Claim 84. (original) The composition of claim 83, wherein the polymer or oiigomer of said monomeric unit is linear or branched.

Claim 85. (original) The composition of claim 83, wherein the polymer or oligomer of said monomeric unit comprises of homopolymer or heteropolymer.

Claim 86. (original) The composition of claim 83, wherein said monomeric unit comprises an analyte-specific moiety.

Claim 87. (original) The composition of claim 86, wherein said analyte-specific moiety is capable of recognizing a component in a biological system.

Claim 88. (original) The composition of claim 87, wherein said biological system is selected from a virus, a phage, a bacterium, a cell or cellular material, a tissue, an organ and an organism, or a combination thereof.

Claim 89. (original) The composition of claim 83, wherein said monomeric unit is selected from a naturally occurring compound, a.modified natural compound, a synthetic compound and a recombinantly produced compound, or a combination thereof.

Claim 90. (original) The composition of claim 83, wherein said analyte-specific moiety is derived or selected from a protein, a polysaccharide, a fatty acid or fatty acid ester and a polynucleotide, or a combination of the foregoing.

Claim 91. (original) The composition of claim 90, wherein said protein is selected from an antibody, a hormone, a growth factor, a lymphokine or cytokine and a cellular matrix protein, or a combination of any of the foregoing.

Claim 92. (original) The composition of claim 91, wherein said antibody comprises a polyclonal or monoclonal antibody.

Claim 93. (original) The composition of claim 90, wherein said polynucleotide is linear or circular.

Claim 94. (original) The composition of claim 90, wherein said polynucleotide is single stranded.

Claim 95. (original) The composition of claim 83, wherein the polymer or oligomer of said binding matrix is linear or branched.

Claim 96. (original) The composition of claim 83, wherein the polymer or ofigomer of said binding matrix comprises a homopolymer or heteropolymer.

Claim 97. (original) The composition of claim 83, wherein said binding matrix is selected from a naturally occurring compound, a modified natural compound, a synthetic compound and a recombinantly produced compound, or a combination thereof.

Claim 98. (original) The composition of claim 83, wherein said binding matrix comprises a member selected from a polypeptide, a polynucleotide and a polysaccharide, or a combination thereof.

Claim 99. (original) The composition of claim 83, wherein said polymeric interactions are selected from ionic interactions, hydrogen bonding, dipole-dipole interactions, or a combination of the foregoing.

Claim 100. (original) The composition of claim 99, wherein said ionic interactions comprise polycationic interactions or polycationic interactions.

Claim 101. (original) The composition of claim 83, further comprising an entity attached to said binding matrix.

Claim 102. (original) The composition of claim 101, wherein said entity comprises a ligand or a compound which increases binding of the binding matrix.

Claim 103. (original) The composition of claim 83, in homogeneous form.

Claim 104. (original) The composition of. claim 83, in heterogeneous form.

Claim 105. (original) A process for delivering a cell effector to a cell, comprising: providing the multimeric complex composition of claim 83 wherein said monomeric unit comprises said cell effector; and administering said composition.

Claim 106. (original) The process of claim 105, wherein said composition is delivered in vivo.

Claim 107. (original) The process of claim 105, wherein said composition is delivered ex vivo.

Claim 108. (original) The process of claim 105, wherein said cell is contained in an organism.

Claim 109. (original) A process for delivering a gene or fragment thereof to a cell, comprising: providing the multimeric complex composition of claim 83,

wherein said monomeric unit comprises said gene or gene fragment; and administering said composition.

Claim 110. (original) The process of claim 109, wherein said composition is delivered in vivo.

Claim 111. (original) The process of claim 109, wherein said composition is delivered ex vivo.

Claim 112. (original) The process of claim 109, wherein said cell is contained in an organism.

Claim 113. (original) A multimeric composition comprising more than one component attached to a charged polymer, wherein said charged polymer is selected from a polycationic polymer, a polyionic polymer, a polynucleotide, a modified polynucleotide and a polynucleotide analog, or a combination of the foregoing.

Claim 114. (original) The multimeric composition of claim 113, wherein said component comprises a protein.

Claim 115. (original) The multimeric composition of claim 114, wherein said protein is selected from an antibody and an $F(ab')_2$ fragment, or both.

Claim 116. (original) The multimeric composition of claim 115, wherein said antibody comprises a polyclonal or monoclonal antibody.

Claim 117. (original) The multimeric composition of claim 115, wherein said antibody is further complex with a target comprising an enzyme.

Claim 118. (original) A nucleic acid construct which when introduced into a cell codes for and expresses a non-native polymerase, said polymerase being capable of .producing more than one copy of a nucleic acid sequence from said construct.

Claim 119. (original) The construct of claim 118, further comprising a recognition site for said non-native polymerase.

Claim 120. (original) The construct of claim 119, wherein said recognition site is complementary to a primer for said non-native polymerase.

Claim 121. (original) The construct of claim 120, wherein said primer comprises transfer RNA (tRNA).

Claim 122. (original) The construct of claim 118, wherein said non-native polymerase comprises a member selected from DNA polymerase, RNA polymerase and reverse transcriptase, or a combination thereof.

Claim 123. (original) The construct of claim 122, wherein said RNA polymerase comprises a bacteriophage RNA polymerase.

Claim 124. (original) The construct of claim 123, wherein said bacteriophage RNA polymerase is selected from T3, T7 and SP6, or a combination thereof.

Claim 125. (original) The construct of claim 122, further comprising a promoter for said RNA polymerase.

Claim 126. (original) The construct of claim 118, wherein said nucleic acid produced from said construct is selected from DNA, RNA, a DNA-RNA hybrid and a DNARNA chimera, or a combination of the foregoing.

Claim 127. (original) The construct of claim 126, wherein said DNA or RNA comprises sense or antisense, or both.

Claim 128. (original) A nucleic acid construct which when introduced into a cell produces a nucleic acid product comprising a non-native processing element, which when in a compatible cell, said processing element is substantially removed during processing.

Claim 129. (original) The construct of claim 128, wherein said processing element comprises an RNA processing element.

Claim 130. (original) The construct of claim 129, wherein said RNA processing element is selected from an intron, a polyadenylation signal and a capping element, or a combination of the foregoing.

Claim 131. (original) The construct of claim 128, wherein said nucleic acid product is single stranded.

Claim 132. (original) The construct of claim 128, wherein said nucleic acid product is selected from antisense RNA, antisense DNA, sense RNA, sense DNA, a ribozyme and a protein binding nucleic acid sequence, or a combination of the foregoing.

Claim 133. (original) The composition of claim 132, wherein said protein binding nucleic acid sequence comprises a decoy that binds a protein required for viral assembly or viral replication.

Claim 134. (original) A process for selectively expressing a nucleic acid product in a cell, which product requires processing for functioning, said process comprising:

(i) providing a nucleic acid construct which when introduced into a cell produces a nucleic acid product comprising a non-native processing element, which when in a compatible cell, said processing element is substantially removed during processing;and

(ii) introducing said construct into said cell.

Claim 135. (original) The process of claim 134, wherein said processing element comprises an RNA processing element selected from an intron, a polyadenylation signal and a capping element, or a combination of the foregoing.

Claim 136. (original) The process of claim 134, wherein said nucleic acid product is selected from antisense RNA, antisense DNA, sense RNA, sense DNA, a ribozyme and a protein binding nucleic acid sequence, or a combination of the foregoing.

Claim 137. (original) The process of claim 134, wherein said construct is introduced ex vivo into said cell.

Claim 138. (original) The process of claim 137, wherein said construct is introduced in vivo into said cell.

Claim 139. (original) The process of claim 134, wherein said construct is introduced into a biological system containing said cell.

Claim 140. (original) The process of claim 139, wherein said biological system is selected from an organism, an organ, a tissue and a culture, or a combination of the foregoing.

Claim 141. (original) A composition comprising a primary nucleic acid component which upon introduction into a cell produces a secondary nucleic acid component which is capable of producing a nucleic acid product, or a tertiary nucleic acid component, or both, wherein said primary nucleic acid component is not obtained with said secondary or tertiary component or said nucleic acid product.

Claim 142. (original) The composition of claim 141, wherein said cell is eukaroytic or prokaryotic.

Claim 143. (original) The composition of claim 141, wherein said primary nucleic acid component is selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a viroid, a phage, a phage,

a plasmid, a plasmid vector, a bacterium and a bacterial fragment, or a combination of the foregoing.

Claim 144. (original) The composition of claim 141, wherein said primary nucleic acid component is single-stranded, double-stranded or partially double-stranded.

Claim 145. (original) The composition of claim 141, wherein said primary nucleic acid component is selected from DNA, RNA and nucleic acid analogs, or a combination thereof.

Claim 146. (original) The composition of claim 145, wherein said DNA, RNA or both are modified.

Claim 147. (original) The composition of claim 141, wherein said secondary nucleic acid component or said tertiary nucleic acid component is selected from DNA, RNA, a DNA-RNA hybrid and a DNA-RNA chimera, or a combination of the foregoing.

Claim 148. (original) The composition of claim 141, further comprising a signal processing sequence.

Claim 149. (original) The composition of claim 148, wherein said signal processing sequence is selected from a promoter, an initiator, a terminator, an intron and a cellular localization element, or a combination of the foregoing.

Claim 150. (original) The composition of claim 148, wherein said signal processing sequence is contained in an element selected from said primary nucleic acid component, said secondary nucleic acid component, said nucleic acid product and said tertiary nucleic acid component, or a combination of the foregoing.

Claim 151. (original) The composition of claim 141, wherein said nucleic acid product is single-stranded.

Claim 152. (original) The composition of claim. 141, wherein said nucleic acid product is selected from antisense RNA, antisense DNA, a ribozyme and a protein binding nucleic acid sequence, or a combination of the foregoing.

Claim 153. (original) The composition of claim 152, wherein said protein binding nucleic acid sequence comprises a decoy that binds a protein required for viral assembly or viral replication.

Claim 154. (original) The composition of claim 141, wherein said component or nucleic acid production is mediated by a vector.

Claim 155. (original) The composition of claim 154, wherein said vector is selected from a viral vector, a phage vector and a plasmid vector, or a combination thereof.

Claim 156. (original) A cell containing the composition of claim 141.

Claim 157. (original) The cell of claim 156, wherein said cell is a eukaryotic or prokaryotic.

Claim 158. (original) The cell of claim 156, wherein said composition has been introduced ex vivo into said cell.

Claim 159. (original) The cell of claim 156, wherein said composition has been introduced in vivo into said cell.

Claim 160. (original) A secondary or tertiary nucleic acid component or nucleic acid product produced from the composition of claim 1.

Claim 161. (original) A composition of matter comprising a nucleic acid component which when present in a cell produces a non-natural nucleic acid product, which product comprises (i) a portion of a localizing localizing entity, and (ii) a nucleic acid sequence of interest.

Claim 162. (original) The composition of claim 161, wherein said portion of the localizing entity (i) is sufficient to permit localization of said non-natural nucleic acid product.

Claim 163. (original) The composition of claim 161, wherein said portion of the localizing entity (i) comprises a cytoplasmic or nuclear localization signalling sequence.

Claim 164. (original) The composition of claim 161, wherein said nucleic acid sequence of interest (ii) is selected from DNA, RNA, a DNA-RNA hybrid and a DNA-RNA chimera, or a combination of the foregoing.

Claim 165. (original) The composition of claim 164, wherein said RNA comprises a nuclear localized RNA complexed with protein molecules.

Claim 166. (original) The composition of claim 165, wherein said nuclear localized RNA comprises a snRNA.

Claim 167. (original) The composition of claim 166, wherein said snRNA comprises U 1 or U2, or both.

Claim 168. (original) The composition of claim 161, wherein said non-natural nucleic acid product is single-stranded.

Claim 169. (original) The composition of claim 161, wherein said non-natural nucleic acid product is selected from antisense RNA, antisense DNA, sense RNA, sense DNA, a ribozyme and a protein binding nucleic acid sequence.

Claim 170. (original) The composition of claim 169, wherein said protein binding nucleic acid sequence comprises a decoy that binds a protein required for a viral assembly or viral replication.

Claim 171. (original) The composition of claim 169, wherein said non-natural nucleic acid product comprises antisense RNA or antisense DNA and said portion of the localizing entity (1) comprises a nuclear localization signalling sequence.

Claim 172. (original) The composition of claim 169, wherein said non-natural nucleic acid product comprises antisense RNA or antisense DNA and said portion of the localizing entity (1) comprises a cytoplasmic localization signalling sequence.

Claim 173. (original) The composition of claim 169, wherein said non-natural nucleic acid product comprises sense RNA or sense DNA and said portion of a localizing entity (1) comprises a cytioplasmic localization signalling sequence.

Claim 174. (original) The composition of claim 161, wherein said nucleic acid component is selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a viroid, a phage, a plasmid, a plasmid vector, a bacterium and a bacterial fragment, or a combination of the foregoing.

Claim 175. (original) The composition of claim 174, wherein said nucleic acid is selected from DNA, RNA, a DNA-RNA hybrid and a DNA-RNA chimera, or a combination of the foregoing.

Claim 176. (original) The composition of claim 174, wherein said nucleic acid is modified.

Claim 177. (original) The composition of claim 161, wherein said cell is eukaryotic or prokaryotic.

Claim 178. (original) The composition of claim 161, wherein the production of said nucleic acid product is mediated by a vector.

Claim 179. (original) The composition of claim 178, wherein said vector is selected from a viral vector, a phage vector and a plasmid vector, or a combination thereof.

Claim 180. (original) A cell containing the composition of claim 161.

Claim 181. (original) The cell of claim 180, wherein said cell is eukaryotic or prokaryotic.

Claim 182. (original) The cell of claim 180, wherein said composition has been introduced ex vivo into said cell.

Claim 183. (original) The cell of claim 180, wherein said composition has been introduced in vivo into said cell.

Claim 184. (original) A biological system containing the cell of claim 180.

Claim 185. (original) The biological system of claim 184, wherein said system is selected from an organism, an organ, a tissue and a culture, or a combination thereof.

Claim 186. (original) A process for localizing a nucleic acid product in a eukaryotic cell, comprising:

(a) providing a composition of matter comprising a nucleic acid component which when present in a cell produces a non-natural nucleic acid product, which product

comprises:

(i) a portion of a localizing entity, and

(ii) a nucleic acid sequence of interest;and

(b) introducing said composition into said cell or into a biological system containing said cell.

Claim 187. (original) The process of claim 186, wherein said portion of the localizing entity (1) is sufficient to permit localization of said nucleic acid product.

Claim 188. (original) The process of claim 186, wherein said nucleic acid product comprises antisense RNA or antisense DNA and said portion of a localizing entity (1) comprises a nuclear localization signalling sequence.

Claim 189. (original) The process of claim 186, wherein said nucleic acid product comprises sense RNA or sense DNA and said portion of a localizing entity (i) comprises a nuclear localization signalling sequence.

Claim 190. (original) The process of claim 186, wherein said nucleic acid product comprises sense RNA or sense DNA and said portion of a localizing entity (1) comprises a nuclear localization signaling sequence.

Claim 191. (original) The process of claim 186, wherein said nucleic acid product comprises snRNA.

Claim 192. (original) The process of claim 191, wherein said snRNA comprises U1 or U2 or both.

Claim 193. (original) The process of claim 186, wherein said composition is introduced ex vivo into said cell or into a biological system containing said cell.

Claim 194. (original) The process of claim 186, wherein said composition is introduced in vivo into said cell or into a biological system containing said cell.

Claim 195. (original) A nucleic acid component which upon introduction into a cell is capable of producing more than one specific nucleic acid sequence, each such specific sequence so produced being substantially nonhomologous with each other and being either complementary with a specific portion of a single-stranded nucleic acid of interest in a cell or capable of binding to a specific protein of interest in a cell.

Claim 196. (original) The nucleic acid component of claim 195, wherein said single-stranded nucleic acids of interest are part of the same polynucleotide sequence or part of different polynucleotide sequences.

Claim 197. (original) The nucleic acid component of claim 195, wherein said single-stranded nucleic acids of interest comprise a viral sequence.

Claim 198. (original) The nucleic acid component of claim 195, wherein said component is derived or selected from a nucleic acid, a nucleic acid construct, a nucleic acid conjugate, a virus, a viral fragment, a viral vector, a phage, a plasmid, a bacterium and a bacterial fragment, or a combination of any of the foregoing.

Claim 199. (original) The nucleic acid component of claim 195, wherein said nucleic acid is selected from DNA, RNA and nucleic acid analogs, or a combination thereof.

Claim 200. (original) The nucleic acid component of claim 199,'wherein said DNA or RNA is modified.

Claim 201. (original) The nucleic acid component of claim 195, comprising either more than one promoter or more than one initiator, or both.

Claim 202. (original) The nucleic acid component. of claim 195, wherein each said specific nucleic acid sequence product is capable of being produced independently from either different pro moters, different initiators, or a combination of both.

Claim 203. (original) The nucleic acid component of claim 195, wherein said specific nucleic acid sequence products are either complementary to a viral or cellular RNA, or bind to a viral or cellular protein, or or a combination of the foregoing.

Claim 204. (original) The nucleic acid component of claim 203, wherein said complementary specific nucleic acid sequence products are capable of acting as antisense.

Claim 205. (original) The nucleic acid component of claim 204, wherein said viral or cellular protein comprises a localizing protein or a decoy protein.

Claim 206. (original) The nucleic acid component of claim 205, wherein said localizing protein comprises a nuclear localizing protein or a cytoplasmic localizing protein.

Claim 207. (original) The nucleic acid component of claim 205, wherein said decoy protein binds a protein required for viral assembly or viral replication.

Claim 208. (original) The nucleic acid component of claim 195, wherein said specific nucleic acid sequence products are selected from antisense RNA, antisense DNA, a ribozyme and a protein binding nucleic acid sequence, or a combination of any of the foregoing.

Claim 209. (original) The nucleic acid component of claim 195, further comprising a means for delivering said component to a cell containing the nucleic acid of interest or the specific protein of interest.

Claim 210. (original) A process for increasing cellular resistance to a virus of interest, comprising:

(a) providing:

(i) transformed cells phenotypically resistant to said virus; and

(ii) a reagent capable of binding to said virus or to a virus-specific site on said cells; and

(b) administering said reagent to a biological system containing said cells to increase the resistance of said cells to the virus of interest.

Claim 211. (original) The process of claim 210, wherein said biological system is selected from an organism, an organ and a tissue, or a combination thereof.

Claim 212. (original) The process of claim 210, wherein said viral resistant cells (i) are eukaryotic or prokaryotic.

Claim 213. (original) The process of claim 210, wherein said viral resistant cells (i) comprise a nucleic acid sequence selected from antisense RNA, antisense DNA, sense RNA, sense DNA, a ribozyme and a protein binding nucleic acid sequence, or a combination of the foregoing.

Claim 214. (original) The process of claim 210, wherein said virus binding reagent (ii) is selected from an antibody, a virus binding protein, a cell receptor protein and an agent capable of stimulating production of a virus binding protein, or a combination of the foregoing.

Claim 215. (original) The process of claim 214, wherein said antibody comprises a polyclonal or monoclonal antibody.

Claim 216. (original) The process of claim 215, wherein said polyclonal or monoclonal antibody is specific to an epitope of said virus of interest.

Claim 217. (original) The process of claim 214, wherein said virus binding protein comprises a CD4 receptor.

Claim 218. (original) The process of claim 214, wherein said cell receptor protein comprises a gp24 protein.

Claim 219. (original) The process of claim 214, wherein said production stimulating agent is selected from an immunological response enhancing adjuvant and a viral antigen, or a combination of both.

Claim 220. (original) The process of claim 210 wherein said reagent (ii) is administered in vivo to said cells.

Claim 221 (original) The process of claim 210, wherein said reagent (ii) is administered ex vivo to said cells.

Claim 222. (original) The process of claim 210, further comprising administering an additional viral resistance enhancing agent (iii).

Claim 223. (original) The process of claim 222, wherein said additional viral resistance enhancing agent (iii) is selected from a protease inhibitor, a nucleoside analog, or a combin.ation thereof.

Claim 224. (original) The process of claim 222, wherein said additional viral resistance enhancing agent (iii) is administered before administering said binding reagent (ii).

Claim 225. (original) The process of claim 222, wherein said additional viral resistance enhancing agent (iii) is administered after administering said binding reagent (ii).

Claim 226. (original) The process of claim 222, wherein said additional viral resistance enhancing agent (iii) is administered at about the same time that said binding reagent (ii) is administered.

Claim 227. (original) A biological system with increased viral resistance obtained by the process of claim 210.

Claim 228. (original) A biological system with increased viral resistance obtained by the process of claim 222.

Claim 229. (original) A nucleic acid construct which when introduced into a cell produces a non-natural product, which product comprises two components:

(i) a binding component capable of binding to a cellular component;and

(ii) a localization component capable of dislocating said cellular component when bound to said product.

Claim 230. (original) The construct of claim 229, wherein said product comprises a protein or a nucleic acid, or a combination of both.

Claim 231. (original) The construct of claim 230, wherein said protein comprises an antibody.

Claim 232. (original) The construct of claim 231, wherein said antibody comprises a polyclonal or monoclonal antibody.

Claim 233. (original) The construct of claim 232 wherein said polyclonal or monoclonal antibody is directed to a cellular component inside the cell.

Claim 234. (original) The construct of claim 229, wherein said cellular component is selected from a nucleic acid, a protein, a virus, a phage, a product from another construct, a metabolite and an allosteric compound, or a combination of the foregoing.

Claim 235. (original) The construct of claim 234, wherein said protein is selected from a viral or non-viral enzyme, a gene suppressor, a phosphorylated protein, or a combination of the foregoing.

Claim 236. (original) The construct of claim 235, wherein said phosphorylated protein comprises an oncogene.

Claim 237. (original) The construct of claim 229, wherein said binding component of said product is selected from a nucleic acid, a protein and a binding entity, or a combination thereof.

Claim 238. (original) The construct of claim 229, wherein said nucleic acid comprises a sequence selected from a complementary sequence to said cellular component and a sequence to a nucleic acid binding protein, or a combination of both.

Claim 239. (original) The construct of claim 237, wherein said protein is selected from an antibody, a receptor and a nucleic acid binding protein, or a combination of the foregoing.

Claim 240. (original) The construct of claim 237, wherein said binding entity is capable of binding metabolites.

Claim 241. (original) The construct of claim 229, wherein said localization component is selected from a nuclear localizing entity, a cytoplasmic localizing entity and a cell membrane localizing entity, or a combination thereof.

Claim 242. (original) The construct of claim 229, wherein said localization component comprises a member selected from a nucleic acid sequence, a nucleic acid structure and a peptide or oligopeptide, or a combination of the foregoing.

Claim 243. (original) The construct of claim 242, wherein said nucleic acid structure comprises a stem and loop structure.

Claim 244. (original) A process for dislocating a cellular component in a cell, comprising:

(1) providing:

(a) a nucleic acid construct which when introduced into a cell produces a non-natural product, which product comprises two components:

(i) a binding component capable of binding to a cellular component; and

(ii) a localization component capable of dislocating said cellular component when bound to said product; and

(2) introducing said nucleic acid construct into a cell of interest or a biological system containing said cell of interest.

Claim 245. (canceled)

Claim 246. (currently amended) A non-naturally occurring non-native polynucleotide construct comprising at lease one sequence segment, which construct when present in a cell produces a nucleic acid product, said construct comprising at least one member selected from the group consisting of a modified nucleotide, a nucleotide analog, a non-nucleic acid entity, and a combination of the foregoing, and said nucleic acid product being selected from the group consisting of antisense RNA, antisense DNA, sense RNA, ribozymes, decoys, messenger RNA, [~~protein~~] and a combination of any of the foregoing and wherein said modified nucleotide, nucleotide analog or non-nuclear acid entity comprises a ligand for a receptor of said cell. –

Claim 247. (previously added) The construct of claim 1, wherein said construct or a portion thereof is linear, circular or branched.

Claim 248 (previously added) The construct of claim 1, wherein said construct or a portion thereof is single-stranded, double-stranded, partially double-stranded or triple-stranded.

Claim 249. (previously added) The construct of claim 248, wherein said sequence segment is in double-stranded form.

Claim 250. (previously added) The construct of claim 248, having at least one terminus, said terminus comprising a polynucleotide tail.

Claim 251. (previously added) The construct of claim 250, wherein said polynucleotide tail is hybridized to a complementary polynucleotide sequence.

Claim 252. (previously added) The construct of claim 246, wherein said construct comprises DNA, RNA, a DNA-RNA hybrid, a DNA-RNA chimera, or a combination of the foregoing.

Claim 253. (previously added) The construct of claim 247, wherein said modified nucleotide has been chemically modified.

Claim 254. (previously added) The construct of claim 253, wherein said chemical modification has been effected to a moiety independently selected from a base, a sugar, and a phosphate, or a combination thereof.

Claim 255. (previously added) The construct of claim 246, wherein at least one of said nucleotide analog or analogs have been modified on the backbone or sidechain or both.

Claim 256. (previously added) The construct of claim 246, wherein said non-nucleic acid entity is attached to a single strand or to both strands of said sequence segment. –

Claim 257. (previously added) The construct of claim 246, wherein said non-nucleic acid entity or entities are selected from a natural or synthetic polymer, and a natural or synthetic ligand, or a combination thereof. -

Claim 258. (previously added) The construct of claim 257, wherein said natural polymer comprises a modified or unmodified member selected from a polypeptide, a protein, a polysaccharide, a fatty acid, and a fatty acid ester, or a combination of the foregoing.

Claim 259. (previously added) The construct of claim 257, wherein said synthetic polymer comprises a homopolymer or heteropolymer.—

Claim 260. (previously added) The construct of claim 259, wherein said homopolymer or heteropolymer carries a net negative charge or a net positive charge. -

Claim 261. (currently amended) The construct of claim 246, wherein said construct exhibits a further biological activity imparted by a [~~said~~] modified nucleotide, a [~~said~~] nucleotide analog, [~~said nucleic~~] a non-nucleic acid entity, [~~a ligand,~~] or a combination of the foregoing. -

Claim 262. (currently amended) The construct of claim 261, wherein said biological activity is selected from nuclease resistance, [~~cell recognition, cell binding,~~] and cellular or nuclear localization, or a combination of the foregoing. -

Claim 263 (canceled)

Claim 264. (currently amended) The construct of claim 246 [~~263~~], wherein said ligand or ligands are attached to a single stranded segment, a double stranded segment, a single stranded construct tail, or a sequence complementary to a construct tail, or a combination of the foregoing. –

Claim 265. (previously added) The construct of claim 263, wherein said ligand or ligands are selected from macromolecules and small molecules, or a combination of both.

Claim 266. (previously added) The construct of claim 246, wherein said construct carried a net positive charge, or a net negative charge, or is neutral or hydrophobic.

Claim 267. (previously added) The construct of claim 246, wherein said construct comprises unmodified nucleotides and at least one member selected from one or more nucleotide analogs and non-nucleic acid entities, or a combination thereof.

Claim 268. (currently amended) A construct which when present in a cell produces a nucleic acid product, said construct being bound non-ionically to an entity comprising a chemical modification or a ligand.

Claim 269. (previously added) The construct of claim 268, having at least one terminus, said terminus comprising a polynucleotide tail.

Claim 270. (previously added) The construct of claim 248, wherein said polynucleotide tail is hybridized to a complementary polynucleotide sequence.

REMARKS

Claims 246, 261, 262, 263, 264 and 268 have been amended to more distinctly claim that which Applicants regard as their invention. As will be discussed below, amended claims 246, 261, 262, 263, 264 and 268 are supported by the specification. Additionally, claim 263 has been canceled.

The First Rejection Under 35 U.S.C. §112, First Paragraph

Claims 246-270 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for the same reasons of record as set forth in the Official action mailed 02/03/99, 11/08/99 and 12/19/00 for old claims 1-24 and 245, and as set forth in the Official action mailed 08/28/01 for claims 246-270.

Applicant's arguments filed 2/28/02 were fully considered by the Examiner but they were not found persuasive. Applicants' reply is found on pages 5-10 of the response.

Applicants asserted that an adequate description has been provided and point to pages 33-47 and 53 of the specification to teach descriptions of the claimed constructs. Applicants' further pointed to figures 1-7 to show use of drawings to show description of the claimed invention. Applicants' further noted that actual reduction to practice is not required to satisfy the written description requirement.

The Examiner responded by stating that MPEP 2163 teaches the following conditions for the analysis of the claimed invention at the time of the invention was made in view of the teachings of the specification and level of skill in the art at the time the invention was made:

> The claimed invention as a whole may not be adequately described when an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence....A lack of written description issue also arises if the knowledge and level of skill in the art would not permit one skilled in the art to immediately envisage the product claimed from the disclosed process.....Generally, there is an inverse correlation between the level of skill and knowledge in the art and the specificity of disclosure necessary to satisfy the written description requirement....The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice...,reduction to drawings..., or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus.

The Examiner stated that the specification as filed teaches in the figures numerous potential constructs using certain modified features for production of products in a cell. Primarily, the specification teaches vector-type constructs having features which are meant to enhance the vector-like constructs for targeting the expressed product in a cell. Such vector-type constructs require specific sequences of nucleic acids, modified nucleotides or analogs for the expression of the claimed products: antisense RNA, antisense DNA, sense RNA, ribozymes, decoys, messenger RNA or protein.

The Examiner further said that neither the specification nor the drawings provided a clear picture of the completed vector-type constructs contemplated, such that one of skill in the art would have been able to immediately envisage the finished product since a representative number of species of such constructs is not adequately described by the most basic necessary chemical and physical structure of nucleic acid constructs, the nucleic acid sequence structure. Most of the drawings in the instant specification taught "ball-and stick" vector-type constructs having a partial idea of the pertinent features of the vectors, but not having a substantially complete sequence. Applicant argues that a reduction to practice is not necessary at the time of the invention, but in the instant case, knowledge of the sequence would be necessary for synthesizing the actual constructs. When considering that instant claim 246 claims any vector construct made of nucleic acids that when present in a cell produces a product, the breath of the claimed invention is extremely broad. From viewing the drawings, for instance figures 1-7 as pointed out by Applicant, one of skill in the art would envision a primer with any ligand(s) attaching to what appears to stand for a nucleic acid vector and primers having fusogenic peptides and tails. The specification teaches prophetically on

pages 33-47 the design of any vector construct having such ligands and additional modifications. There is no evidence on the record of a relationship between the structure of the lines and features in drawings 1-7 for instance to specific nucleic acid sequences of vectors or the use of known vectors from which specific modifications may be added. Sequence structure of nucleic acids is a necessary stating point for making a vector for expression of nucleic acid products as claimed. One of skill in the art would have not recognized that Applicant was in possession of a representative number of species of any finished expression vectors in view of the teachings of figures 1-7 and pages 33-47 of the specification since no specific guidance was given for the design of the most basic elements of the claimed nucleic acid constructs. The scope of the claim includes numerous structural variants, and the genus is highly variant because a significant number of structural difference between genus members I permitted. Although the specification states that these types of changes are routinely done in the art, the specification and claim do not provide any guidance as to what changes should be made and in what order. The general knowledge and level of skill in the art do not supplement the omitted description of sequence structure, as starting point for instance, because specific, not general, guidance is what is needed for making the finished constructs. For these reasons, Applicant was not in possession of the claimed genus at the time the invention was made.

Applicants respectfully traverse rejection. While the Examiner notes that Figures 1 to 7 lack any sequence information and that this is a necessary element for the teaching of the present invention, applicants respectfully submit that such sequences are not necessary. In Applicants' view, for any given construct that is synthesized according to the directions of the present invention, the sequence

construct will be important to the practitioner, but specific sequences are not needed for an understanding of how the invention is generally practiced.

A knowledge of the specific sequences that the applicants would have used in the examples of the application would not provide any useful additional teaching elements which a practitioner would need in practicing the present invention using their particular constructs. Moreover, the use of graphics that employ lines demarcating functional elements such as ligands and fusogenic proteins and complementarity between nucleic acid strands should be sufficient in that the particular sequences represented by such lines are not required to understand the relationships that are being depicted. Furthermore, examples have been given that would generate constructs depicted by these figures.

For instance, Example 1 provides an example of starting with a single-stranded circle with an F1 packaging signal. At the time of the submission of the application, there were numerous vectors available with complete information available concerning their sequences and genetic characteristics. A skilled practitioner of the art would have been able to use such cloning vectors to insert nucleic acid sequences coding for biological functions that would have been of interest to the practitioner (such as antisense, mRNA or decoys). Such cloning procedures were an ordinary practice of the art at the time of the filing of the application. Further in the example, the synthesis of a primer is described. As mentioned above, the sequences of the cloning vectors are known and additionally, due to the orientation of the F1 packaging signal, the particular strand that would be produced after infection by a helper phage would also be known. As such, it would be a simple matter for a skilled practitioner of the art to decide which

particular sequences of his construct should be used to design the allyl amine-modified oligonucleotide described in the example. Further in the example, methods are disclosed for the prepartion of a ligand and its attachment to an allyl amine-modified oligonucleotide. This was a general method that could be used for any nucleic acid that comprised allyl amine moieties. Hybridization of this oligonucleotide would result in a nucleic acid construct depicted in Figure 1a.

Example 2 described the use of the product of Example 1 in a strand extension reaction to produce a nucleic acid construct depicted in Figure 1a.

Example 3 gives general directions for making the construct depicted in Figure 2.

Example 4 gives general directions for making the construct depicted in Figure 3. The lower part of the diagram contains a brief description of its use.

Example 5 gives directions for making a construct as depicted in Figure 4. An intermediate product is shown in Figure 5.

Example 6 gives directions for making a construct depicted in Figure 6.

In general, there is an abundance of information on how a practitioner can apply the present invention to transforming their plasmid into the various constructs that have been disclosed in the invention. As such, there is no undue experimentation required for the practice of the present invention as a result of the information provided in the Description of the Invention, Figures and Examples.

To summarize, Applicants would like to stress that as described in Example 1, **any** plasmid, from a variety of commercial sources, containing an F1 packaging signal may be used. In view of the above arguments, Applicants would like to assert that the rejection under 35 U.S.C. §112, first paragraph, has been overcome. Applicants therefore respectfully request that the rejection be withdrawn and that claims 246-270 are allowed.

The Second Rejection Under 35 U.S.C. § 102(e)

New claims 246-270 stand rejected under 35 U.S.C. 102(e) as being anticipated by Meyer et al. for the same reasons of record as set forth in the Official action mailed 02/03/99, 11/08/99 and 12/19/00 for old claims 1-24, and as set forth in the Official action mailed 08/28/01 for claims 246-270.

Applicant's arguments filed 2/28/02 have been fully considered by the Examiner, but they have not been persuasive.

The Examiner stated that Applicants asserted that Meyer et al. does not teach constructs defined by the instant specification and stated that the ODN-peptide conjugates of Meyer et al. clearly are not constructs because "the conjugates cannot integrate into cellular nucleic acid or exist in an extrachromosomal state. The ODN-peptide conjugates certainly cannot propagate copies of itself in either the integrated or extrachromosomal state. In other words, the ODN-peptide conjugates of Meyer et al. are not capable of self replication."

The Examiner responded by stating that Applicants are arguing limitations of the claimed constructs which are not present in the claims. The claims do not

require that the constructs integrate into cellular nucleic acid or exist in an extrachromosomal state, nor that they can propagate copies and are capable of self replication. Claim 247 recites wherein the construct is linear. The claims don't recite that such linear constructs self-replicate.

Meyer et al. thus continues to anticipate the claimed invention.

Applicants respectfully traverse this rejection. The present invention is not anticipated by Meyer et al. The language of claims 246, 261, 262, 263, 264 and 268 has been amended to further describe the invention and particularly point out how the invention differs from Meyer et al. The amendments are fully supported by the specification.

Firstly, Meyer et al. describes a procedure that induces the degradation of a messenger RNA target. Specifically, this degradation results in the destruction of a nucleic acid. Therefore, no nucleic acid is produced. In contrast, Applicants' invention more particularly describes a nucleic acid that is produced by the construct of the present invention.

Secondly, we have added a limitation in the claims that is fully supported by the application's disclosure and figures, which is not found in Meyer et al. This limitation is a ligand. Specifically, the modified nucleotide, nucleotide analog or non-nucleic acid entity of the present invention comprises a ligand. Meyer et al. makes absolutely no mention of such a limitation.

In view of the above arguments, Applicants would like to assert that the rejection under 35 U.S.C. § 102(e) has been overcome. Applicants therefore

respectfully request that the rejection be withdrawn and that claims 246-270 are allowed.

Summary and Conclusions

Claims 246-270 are presented for further examination. In light of the aforesaid arguments and the amendments to the claims, Applicants respectfully request that the Examiner withdraws her rejections and allows claims 246-270.

If a telephone conversation would further the prosecution of the present application, Applicants' undersigned attorney requests that she be contacted at the number provided below.

Respectfully submitted,

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